

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 07 MAR 2006

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Applicant's or agent's file reference 1200320WO	FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/US2004/035250	International filing date (day/month/year) 22.10.2004	Priority date (day/month/year) 27.10.2003	
International Patent Classification (IPC) or national classification and IPC C09D5/10, C09D5/24, C23F13/02, C23F13/06			
Applicant POLYONE CORPORATION et al.			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☐ sent to the applicant and to the International Bureau) a total of sheets, as follows:

☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒ Box No. I Basis of the opinion

☐ Box No. II Priority

☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability



☐ Box No. IV Lack of unity of invention

☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

☐ Box No. VI Certain documents cited

☒ Box No. VII Certain defects in the international application

☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 24.05.2005	Date of completion of this report 06.03.2006
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Trauner, H-G Telephone No. +49 89 2399-7533 <div style="text-align: right;">  </div>

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2004/035250

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-21 as originally filed

Claims, Numbers

1-19 received on 24.05.2005 with letter of 24.05.2004

Drawings, Sheets

1/1 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2004/035250

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-19
	No: Claims	
Inventive step (IS)	Yes: Claims	1-19
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-19
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/US2004/035250

Ad V

The subject-matter of the present application is novel and inventive in the sense of Art. 33(1)-(3) PCT.

The present application relates to a protection polymeric compound based on a system containing metal particles dispersed in a flowable material, wherein said particles are less noble than a metal substrate to be protected. It is further claimed a film containing said protection polymeric compound, a metal substrate coated therewith and a protection method.

D2 describes compositions containing a polymer as a flowable material and carbon fibers as a carbonaceous conductive media in the sens of components (a) and (b) respectively of present claim 1. The composition further includes silver flakes. D1. however, does not mention the fact, that a metal substrate shall be covered by a sacrificial metal particle system according to claim 1 (c).

The subject-matter of present claim 1 and also those of independent claims 13-16 is novel and inventive vis-à-vis D1 and D2.

Ad VII

Present claims 4 and 5 have no dependencies. The term "tubes" is not mentioned in claim 1.

The subject-matter of the present application is industrially applicable.

What is claimed is:

1. A cathodic protection polymeric compound, comprising:
 - (a) flowable material;
 - 5 (b) carbonaceous conductive media dispersed in the flowable material;
and
 - (c) sacrificial metal particles also dispersed in the flowable material,
wherein the sacrificial metal particles are less noble than a metal substrate to
which the compound is intended to contact.
- 10 2. The compound of Claim 1, wherein the carbonaceous conductive media
serve as a carbon-based electron transfer agent and are in the form of particles,
platelets, fibers, tubes, or combinations thereof and optionally are functionalized
with plating of metal.
- 15 3. The compound of Claim 1, wherein the carbonaceous conductive media are
fibers.
4. The compound of Claim 1, wherein the tubes are multiple-walled nanotubes.
- 20 5. The compound of Claim 1, wherein the tubes are single-walled nanotubes.
6. The compound of Claim 1, wherein the flowable material is polymeric and is
capable of forming a film or coating.
- 25 7. The compound of Claim 1, wherein the flowable material is a pressure
sensitive adhesive.
8. The compound of Claim 1, wherein the metal substrate is iron-containing
30 and the sacrificial metal particles are zinc or aluminum.

9. The compound of Claim 1, further comprising an ionically conductive agent in the flowable material.
- 5 10. The compound of Claim 9, further comprising a means for reducing passivation of the sacrificial metal particles.
11. The compound of Claim 10, wherein the means is a complexing agent.
- 10 12. The compound of Claim 1, further comprising an inherently conductive polymer in the flowable material.
13. A film formed from the compound of Claim 1.
- 15 14. A metal substrate having a surface to which the compound of Claim 1 is contacted.
15. A method of protecting a metal substrate, comprising the step of contacting the compound of Claim 1 with the metal substrate.
- 20 16. A method of using the compound of Claim 1, comprising applying the compound of Claim 1 to a metal substrate, wherein the compound and the metal substrate form a galvanic circuit in which the sacrificial metal particles are anodes and the metal substrate is a cathode and in which the carbonaceous
- 25 conductive media serve as an electron transfer agent between the anodes and cathode.
17. The method of Claim 16, wherein the galvanic circuit is passive.

18. A method of making the compound of Claim 1, comprising the steps of mixing the carbonaceous conductive media into the flowable material and mixing the sacrificial metal particles into the flowable material.

- 5 19. The method of Claim 18, wherein the carbonaceous conductive media are present in an amount of from about 0.01 to about 10 weight percent of total solids of the flowable material, and wherein the sacrificial metal particles are present in an amount of from about 0.1 to about 95 weight percent of the total solids of the flowable material.

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